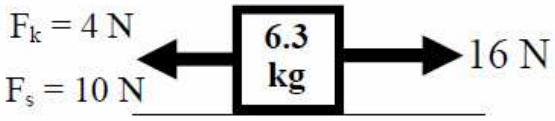
Name: _____

Period: _____

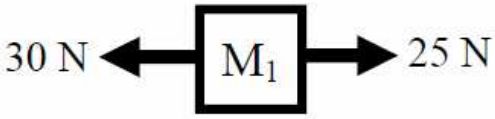
Forces Review

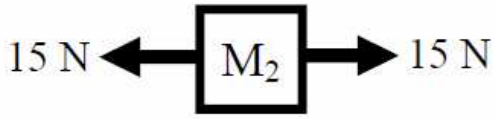
3.9

1. A gun shoots a bullet. Which is greater: the force of the gun on the bullet; the force of the bullet on the gun?



2. Use the mass at the left to answer the following.
   A. Draw a force diagram below the object.
   B. How much force is necessary to start the object moving?
   C. How much force is necessary to keep it moving?
   D. What is the normal force on the object?
   E. If the object starts at rest, does it start to slide?
   F. If it was already moving, calculate its acceleration.

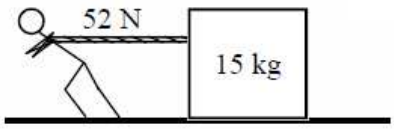




3. Which of the two above objects applies: M_1, M_2, both, or neither?

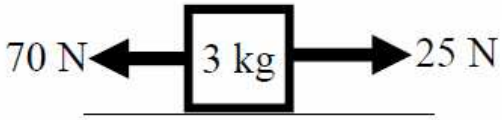
A. ____ Could be at rest.
B. ____ Could be accelerating.
C. ____ Could be moving to the left.
D. ____ Has a net force.
E. ____ Is at constant speed.
F. _____Could be moving.
G. _____Could be accelerating to the right.
H. _____Could be moving up.
I. _____Could have a velocity = 0m/s.
J. _____Has no net force.

4 A 120 kg object is on Pluto, which is still quite depressed by its recent astronomical demotion.
   A. What is the mass of the object on the earth?
   B. What is the weight of the object in space?
   C. What is the weight of the object on the earth?
   D. Given Pluto's information ($m=1.31\times10^{22}$kg; $r = 1.161\times10^{6}$), calculate the weight of the object on Pluto.



5 Slim Jim pulls with 52 N on a 15 kg box across the floor at constant speed. There is friction between the box and the floor.
   A. Since it is at constant speed, what is its acceleration?
   B. Draw all of the forces on the box.
   C. In the x-direction only, use $\Sigma F = ma$ to find the force of friction on the box.

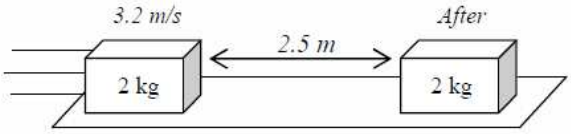
   D. Challenge: Find the coefficient of friction of the floor.



6 Find the acceleration of the object.

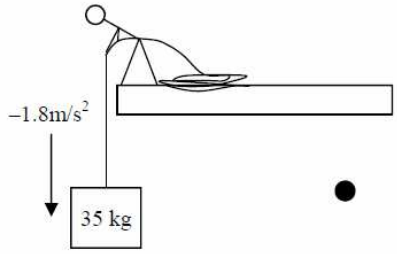
7 A box moving 3.2m/s stops in 2.5m.

A. Use a kinematic equation to find the acceleration of the object.



B. Find the force of friction that stopped the object.

8 A 6kg mass has an acceleration of 8.2m/s^2. What net force caused this?



9 Slim Jim is lowering a 35kg mass with an acceleration of −1.8 m/s^2.

A. On the dot, draw a force body diagram.

B. Find the tension in the rope.

10 A rightward force of 302 N is applied to a 28.6-kg crate to accelerate it across the floor. The coefficient of friction between the crate and the floor is 0.750. Determine the acceleration of the crate.

11 During a football workout, two linemen are pushing the coach on the sled. The combined mass of the sled and the coach is 300. kg. The coefficient of friction between the sled and the grass is 0.800. The sled accelerates at a rate of 0.580 m/s/s. Determine the force applied to the sled by the lineman.

12 A basketball star exerts a force of 3225 N (average value) upon the gym floor in order to accelerate his 76.5-kg body upward. (a) Determine the acceleration of the player. (b) Determine the final speed of the player if the force endures for a time of 0.150 seconds.

13 At the end of the Giant Drop free fall ride, riders experience a large upward normal force to bring their falling bodies to a stop. Determine the normal force value required to accelerate a 52.1-kg physics student with an upward acceleration of 27.4 m/s/s.